CLAIMS

What is claimed is:

1. A laser capture microdissection apparatus, comprising:

a transfer film carrier having a substrate surface; and

a laser capture microdissection transfer film coupled to said substrate surface of said transfer film carrier, said laser capture microdissection transfer film including at least one integrally formed structural feature that protrudes and provides a controllable spacing between said laser capture microdissection transfer film and a sample.

2. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film includes a material, that upon exposure to sufficient electromagnetic energy, expands and projects itself away from said substrate surface.

3. The laser capture microdissection apparatus of claim 1, further comprising a scattering media in proximity to said laser capture microdissection transfer film.

4. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film includes an absorptive substance.

5. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film is hot vacuum baked onto said substrate surface.

6. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film is bonded to said substrate surface with a refractive index matching transparent glue.

7. The laser capture microdissection apparatus of claim 1, wherein said transfer film carrier includes a negative draft such that a distal diameter defined by said surface of said transfer film carrier is greater than a proximal diameter defined by an inner perimeter of said transfer film carrier.

8. The laser capture microdissection apparatus of claim 7, wherein said transfer film carrier includes a girdle that is contiguous with said negative draft.

9. The laser capture microdissection apparatus of claim 7, wherein said transfer film carrier includes a chamfer that is contiguous with said substrate surface.

10. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film has a thickness that is less than 500 microns.

11. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film has a thickness that is held to within 20%.

12. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film has a capture surface that is opposite said substrate surface, said capture surface having a flatness that is held within five microns.

13. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film includes at least one pedestal that protrudes and defines a laser capture microdissection acquisition zone.

14. The laser capture microdissection apparatus of claim 1, wherein said laser capture microdissection transfer film includes a protruding feature that runs along at least three points of a perimeter of said laser capture microdissection transfer film.

15. A microcentrifuge tube cap comprising the laser capture microdissection apparatus of claim 1.

16. An integral portion of a biological reaction vessel, comprising:

a transfer film carrier having a substrate surface; and

a laser capture microdissection transfer film coupled to said substrate surface of said transfer film carrier.

17. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film includes a material, that upon exposure to sufficient electromagnetic energy, expands and projects itself away from said substrate surface.

18. The integral portion of a biological reaction vessel according to claim 16, further comprising a scattering media in proximity to said laser capture microdissection transfer film.

19. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film includes an absorptive substance.

20. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film is hot vacuum baked onto said substrate surface.

21. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film is bonded to said substrate surface with a refractive index matching transparent glue.

22. The integral portion of a biological reaction vessel according to claim 16, wherein said transfer film carrier includes a negative draft such that a distal diameter defined by said surface of said transfer film carrier is greater than a proximal diameter defined by an inner perimeter of said transfer film carrier.

23. The integral portion of a biological reaction vessel according to claim 22, wherein said transfer film carrier includes a girdle that is contiguous with said negative draft.

24. The integral portion of a biological reaction vessel according to claim 22, wherein said transfer film carrier includes a chamfer that is contiguous with said substrate surface.

25. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film has a thickness that is less than 500 microns.

26. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film has a thickness that is held to within 20%.

27. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film has a surface opposite said substrate surface having a flatness that is held within five microns.

28. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film includes at least one pedestal that protrudes and defines a laser capture microdissection acquisition zone.

29. The integral portion of a biological reaction vessel according to claim 16, wherein said laser capture microdissection transfer film includes a protruding feature that runs along at least at least three points of a perimeter of said laser capture microdissection transfer film.

30. A microcentrifuge tube cap comprising the integral portion of a biological reaction vessel according to claim 16.

31. A laser capture microdissection assembly comprising:

a plate having a top surface; and

at least one laser capture microdissection cap coupled to said top surface of said plate, wherein said at least one laser capture microdissection cap includes

a transfer film carrier having a substrate surface; and

a laser capture microdissection transfer film coupled to said substrate surface of said transfer film carrier.

32. The laser capture microdissection assembly of claim 31, further comprising a release layer coated on said plate, said release layer being located between said plate and said laser capture microdissection transfer film of each of said at least one laser capture microdissection cap.

33. The laser capture microdissection assembly of claim 32, wherein said release layer includes at least one nonadhesive material selected from the group consisting of silicones and polytetrafluoroethylenes.

34. The laser capture microdissection assembly of claim 33, wherein said at least one nonadhesive material is a silicone containing surfactant agent.

35. The laser capture microdissection assembly of claim 31, wherein a plano-concave void is located between said laser capture microdissection transfer film of said at least one laser capture microdissection cap and said top surface of said plate.

36. The laser capture microdissection assembly of claim 31, wherein said laser capture microdissection transfer film includes a transparent thermoplastic.

37. The laser capture microdissection assembly of claim 31, wherein said laser capture microdissection transfer film includes an absorptive substance.

38. The laser capture microdissection assembly of claim 31, wherein said laser capture microdissection transfer film is hot vacuum baked onto said substrate surface.

39. The laser capture microdissection assembly of claim 31, wherein said transfer film carrier includes a negative draft such that a distal diameter defined by said surface of said transfer film carrier is greater than a proximal diameter defined by an inner perimeter of said transfer film carrier.

40. The laser capture microdissection assembly of claim 31, wherein said laser capture microdissection transfer film has a thickness that is less than 500 microns.

41. The laser capture microdissection assembly of claim 31, wherein said laser capture microdissection transfer film has a thickness that is held to within 20% of a given value.

42. The laser capture microdissection assembly of claim 31, wherein said laser capture microdissection transfer film has a surface opposite said substrate surface having a flatness that is held within five microns.

43. The laser capture microdissection assembly of claim 31, further comprising at least one diffuser coupled to said at least one transfer film carrier.

44. A set of microcentrifuge tube caps comprising the laser capture microdissection assembly of claim 31.

45. A method of imaging a sample with a microscope, comprising:

providing said microscope;

locating a scattering media within a beam path defined by said microscope and within a few millimeters of a sample; and

imaging said sample through said scattering media with said microscope.

46. The method of imaging a sample with a microscope according to claim 45, wherein said scattering media is optically coupled to a laser capture microdissection film.

47. A microscope, comprising:

a scattering media located within a beam path defined by said microscope and within a few millimeters of a sample.

48. The microscope of claim 47, further comprising a laser capture microdissection film optically coupled to said scattering media.

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